

FORM APPROVED OMB NO. 40-R3712

GRAIN DIVISION
PLANT VARIETY PROTECTION OFFICE
NATIONAL AGRICULTURAL LIBRARY

1a. TEMPORARY DESIGNATION OF	16. VARIETY NA	ME		IAL USE ONLY		
VARIETY	Section 1		PV NUMBER Q 400	DOF		
243	Nassau	m your state of	PV NUMBER 8400005			
2. KIND NAME	3. GENUS AND SE		10/21/83	2:30 XXMX		
Kentucky bluegrass	Poa pratens	sis L.	FEE RECEIVED	DATE P.M.		
4. FAMILY NAME (BOTANICAL)	5. DATE OF DETE	ERMINATION	\$ 1,000	10/21/83		
Gramineae	1980		\$ 500.00	12/11/84		
6. NAME OF APPLICANT(S)	The state of the s	t and No. or R.F.D. No	o., City, State, and ZIP	8. TELEPHONE AREA		
Lofts Inc. and Jacklin Seed	P.O. Box 1	46 Bound Brook	, NJ 08805	(201)560-1590		
Company	W. 5300 Jac	cklin Ave., Po	st Falls, ID 3854-9499	(208)773-7581		
9. IF THE NAMED APPLICANT IS NOT A PER		10. IF INCORPORA	ATED, GIVE STATE AND	11. DATE OF INCOR-		
ORGANIZATION: (Corporation, partnership,	association, etc.)	Lofts - New	DRPORATION	11/10/48		
Corporations	exception in	Jacklin - I	daho	2/11/83		
12. Name and mailing address of applic	ant representative	e(s), if any, to serv	e in this application a	nd receive all papers		
Dr. Richard Hurley	Dr.	Leah Brilman				
Lofts Inc.	Jacl	klin Seed Co.				
P.O. Box 146	W. 5	300 Jacklin A	ve.			
Bound Brook, NJ 08805	Pos	t Falls, ID 8	3854-9499			
13A. Exhibit A, Origin and Breed 13B. Exhibit B, Novelty Statement 13C. Exhibit C, Objective Descrip 13D. Exhibit D, Additional Descrip	nt. otion of the Variety	(Request form from	91 56 56 10 3 10 67 10 5 10 5			
14A. Does the applicant(s) specify that see (See Section 83(a). (If "Yes," answe	d of this variety be r 14B and 14C belo	sold by variety name	only as a class of certific	ed seed?		
14B. Does the applicant(s) specify that thi limited as to number of generations?	s variety be 14	c. If "Yes," to 14B breeder seed?	, how many generations	of production beyond		
X	YES NO	FOUNDATION	E REGISTERED	CERTIFIED		
15. Does the applicant(s) agree to the pu	blication of his/her	(their) name(s) and a	address in the Official Jo	urnal?		
don such a day of present		tagi secili iss s	the parent sale has	X YES NO		
The applicant(s) declare(s) that a vial a certificate and will be replenished p. The undersigned applicant(s) is (are variety is distinct, uniform, and stal	eriodically in according the owner(s) of t	dance with such regularies sexually reprodu	lations as may be applic ced novel plant variety.	able. and believe(s) that the		
tion 42 of the Plant Variety Act.						
Applicant(s) is (are) informed that fall	se representation h	erein can jeopardize	protection and result in	penalties.		
S-pt. 15, 1983		Luci IV	(SIGNATURE OF APPL	ICANT)		
10-4-83		Look	a. Beilm	an 1		
(DATE)		year	(SIGNATURE OF APPL	ICANT)		

INSTRUCTIONS

a,500 seeds

GENERAL: Send an original copy of the application, exhibits and \$250.00 fee to U.S. Dept. of Agriculture, Agricultural Marketing Service, Grain Division, National Agricultural Library, Beltsville, Maryland 20705. (See Section 180.175 of the regulations and rules of practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

ITEM

- Give the date the applicant determined that he had a new variety based on (1) the definition in Section 41(a) of the Act and (2) the date a decision was made to increase the seed.
- Give (1), the genealogy, including public and commerical varieties, lines, or clones used, and the breeding method. (2), the details of subsequent stages of selection and multiplication. (3), the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4), evidence of stability.
- Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties; (1) identify these varieties and state all differences objectively; (2) Attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.
- 13c Fill in the Exhibit C, Objective Description form for all characteristics, for which you have adequate data.
- Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C.

 Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe; such as; plant habit, plant color, disease resistance, etc.

14A If "YES" is specified (seed of this variety be sold by variety name only as a class of certified seed) the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled or published or the certificate has been issued. However, if the applicant specifies "NO", he may change his choice. (See Section 180.15 of the Regulations and Rules of Practice.)

EXHIBIT 13A

ORIGIN AND BREEDING HISTORY OF NASSAU KENTUCKY BLUEGRASS

Nassau is a highly apomictic first generation hybrid developed by crossing "NJE P-59" Kentucky bluegrass with "Baron" Kentucky bluegrass.

A cross was made between NJE P-59 Kentucky bluegrass and Baron Kentucky bluegrass in March 1972. NJE P-59 was used as the female parent. NJE P-59 was selected from the 15th fairway of the Colonia golf course near Colonia, New Jersey by Cyril R. Funk, Jr. in 1963. NJE P-59 is a moderately low growing, turf-type bluegrass with medium texture and a bright, medium dark green color. It has an exceptionally attractive early spring color, the ability to stay green into late fall and early winter, and the capability of maintaining good winter color in protected locations. NJE P-59 has shown good resistance to the leaf spot and crown rot disease incited by Drechslera poae (Baudys) Shoem, and the leaf rust incited by Puccinia poae nemoralis Otth. It has also shown moderately good resistance to stripe smut caused by Ustilago striiformis (Westend.) Niessl, snow mold caused by Typhula incarnata Lasch, stem rust caused by Puccinia graminis Pers. and the Fusarium blight disease. NJE P-59 has moderately good seed yield potential. Turf produced normally has a high proportion of stemmy reproductive tillers in late spring. Baron is a cultivar selected from an old turf in the Netherlands. It has been noted for high seed yields, generally good turf performance over a wide area of the world, and above average resistance to most turf diseases.

The progeny of the NJE P-59 x Baron cross was established in a spaced-plant nursery at Adelphia, New Jersey during the early fall of 1972. Plant 2947-4 was selected from this progeny. Seed harvested from this plant was used to establish plot A 73-653 in September 1973 and turf plot H74-243 in September 1974. Tests to determine mode of reproduction and seed yield potential were conducted by Jacklin Seed Company of Post Falls, Idaho. Additional evaluation trials were subsequently established in New Jersey and Idaho. The variety was also included in the National Kentucky bluegrass test established in 1980.

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lungues in dence 1972. July 1959 who december percent. Delt 1-199 are as and the color asony and maked project a but gratered a prior district a cyclede de los valas estras a reconstruir policiente de la construir d The state of the s in the part in the heart and a to be been need for high seed visites, comer in

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A spaced-plant breeder seed nursery was established near Post Falls, Idaho in the spring of 1978. Seed produced was used to establish a 10 acre foundation field in the spring of 1980.

Nassau appears to be about 95 percent apomictic. Most of the aberrants produced are smaller and weaker than the maternal plants and are of little consequence in seed production and turf use. Due to the facultative apomixis characteristics of Poa pratensis, these aberrants can be expected to occur whenever seed is harvested from maternal plants. Since most aberrants result from sexual reproduction, a side array of variation is produced. Most aberrants exhibit obvious morphological differences from maternal plants. Most are shorter and weaker but a small frequency of taller, coarser plants are produced. Aberrants often differ in size, growth, habit, color, leaf texture, maturity, and panicle characteristics from maternal plants.

Nassau is highly apomictic and is thus a uniform and stable variety. All seed lots, evaluated have produced turf of comparable quality and acceptable uniformity. Aberrant progeny should be rogued from breeders and foundation fields to insure continued uniformity and stability.

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EXHIBIT 13B

NOVELTY STATEMENT

Nassau Kentucky bluegrass is a moderately low growing turf-type variety with a dark green color (tables 2&3), relatively wide leaf blade (table 6), which produces a moderately dense stand of turf. In established turf Nassau has shown improved drought tolerance (table 7). Nassau can be distinguished from all other varieties by the combination of spaced-plant and turf characteristics described in tables 1 - 17.

Nassau most closely resembles Baron, However, Nassau and Baron differ by the following characteristics:

- 1. Nassau is earlier in heading (12 days) and date of anthesis (4 days) compared to Baron (Table 1).
- 2. Nassau is taller in plant height (26 cm.) compared to Baron (table 1).
- 3. Nassau has a larger panicle length (30 cm.) compared to Baron (table 1).
- 4. Nassau has more winter color retention than Baron (table 4). (2)
- 5. Nassau has earlier spring green-up compared to Baron (table 5).

Additions: 891 1/23/84/letter 12/28/83

- 1.'Nassau'provides a color which is darker than'Baron!
 Nassau has a dark green color compared to 'Baron's' medium green color.
- 2. 'NASSAU'RETAINS ITS DARK GREEN COLOR INTO THE WINTER months where 'Baron' loses its color early in the winter.

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TABLE 1

MORPHOLOGICAL COMPARISON OF FIRST YEAR SPACED PLANTS OF KENTUCKY BLUEGRASS VARIETIES NEAR ALBANY, OREGON, 1980.

	Heading Date	Anthesis Date	Plant Height (CM)	Panicle Length (CM)	Flag leaf Length(CM)	Number of Branches at Lowest Panicle Whorl	Panicle Habit	Growth Habit of Lowest Panicle Whorl	Growth Habit	Weight of Seed Per Panicle
		May								
Nassau	4/17	15	61	97	49	3.9	2	1.3	1.7	100
Merion	4/26	28	30	65	28	4.6	2	3.7	2	75
Nugget	4/18	14	15	45	14	2.2	2.7	2	1.3	35
Glade	5/5	28	25	75	49	3.6	2	2.3	1	75
Baron	4/29	19	35	67	36	6.7	2.7	1.7	1.7	155
Adelphi	4/30	23	48	115	49	3.9	1.3	1	2.3	125
Delta	4/16	15	87	147	76	5.2	2.3	3.3	2.7	170
Fylking	5/1	23	42	98	43	4.3	1.7	1.7	1.7	135
Newport	4/20	15	60	84	47	4.6	3	1.3	3	140
Touchdown	4/18	15	42	78	29	3.7	2	1.3	2	115
Eclipse P-164	5/3	19	26	69	35	3.1	2.3	3.3	1.7	100
LSD .05		3	6	9	8	0.5				57
Dates of ar and plant m from a nurs were replic plants per	sery when	ents we re vari times w	re taker eties				1=Nodding 3=Erect	1=Drooping 5=Upright]=Prostrate 3=Erect	

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U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE LIVESTOCK, MEAT, GRAIN, & SEED DIVISION PLANT VARIETY PROTECTION OFFICE BELTSVILLE, MARYLAND 20705

(Bluegrass)

OBJECTIVE DESCRIPTION OF VARIETY

		BLUEG	RASS (Poa spr	0.)		
NAME OF APPL	ICANT(S)			NATION VARIETY	NAME	4
Lofts Inc.						
Jacklin See			243	Na	ssau	
	t and No. or R.F.D. No., City, State,		de)		OFFICIAL USE	ONLY
	46, Bound Brook, NJ O			PVPO NU	PVPO NUMBER	
W. 5300 Jacklin Ave., Post Falls, ID 8				8	400005	
be recorded to he typical for the va to determine planand number of planand number o	r which characterizes the variety in tanks (e.g., 09, 081). Thoselp establish novelty or uniqueness. Criety. Measured data should be for Sont colors; designate system used: Albany, Oregon 4 Post Falls, Idah	Characteristic SPACED PLA	s described, includir NTS. Royal Hortic	are preferring numerical measure cultural Society or an Describer sach	ed to be recorded, ments, should repr y recognized color	Any others should resent those that are r fan may be used
1. SPECIES:						
2	1 = Poa compressa	2 = P. pra	tensis	3 = P. trivialis	4	= Others (Specify)
2 47 47 47 18	Chromosome number					
3	N: (0 = Not tested, 1 = Not adapted Northeast 2 Pacific N.W. 3 Other (Specify)	Transition	al zone 1	Southeast Southwest (CA., A		orth Central
3. MATURITY (At first anthesis): Give test area	Albany	. Oregon			
* 2	1 = Very early		(Delta, Mystic)	3 = Medium early	(Fylking, Nugget)	
	4 = Medium late (Newport, Adelph			5 = Late (Merion,		
	6 = Very late (Pacific)					
	May 15	Date of Fi	rst Anthesis			
0 4	Number of days earlier than	6	1 = Nugget	2 = Fylking	3 = Delta	
	Maturity same as	1	4 = Merion	5 = Newport	6 = Baron	
	Number of days later than	山 /	7 = Mystic	8 = Sabre	9 = Reubens	
4. PLANT HEIGH	HT (At maturity-Average of longest s	hoot of 10 p	lants from soil surfa	ice to top of panicle)	: Test area All	pany. Oregon
* 3	1 = Short (Nugget)		n short (Baron, Fylk			
	3 = Medium tall (Merion, Adelphi)		A - Tall /Dales			
0 6 1	cm Height		4 = Tall (Delta	ь	- Very tall	
2 6	cm Shorter than * 3)	1 = Nugget	2 = Fylking	3 = Delta	4 = Merion
	Height same as ★ 5	5	5 = Newport	C = D		
2 6	cm Taller than ★ 6	1	9 = Reubens	6 = Baron	7 = Mystic	8 = Sabre
5. GROWTH HAE	BIT:					
* 1	Habit: 1 = Prostrate (Nugget)		2 = Semi-prostrate	(Merion)	3 = Erect	(Delta)
0 20	cm Amount of spread by rhizomes		De	st Falls, ID		

Lofts Inc. P.O. Box 145, Sound Brook, NJ 08805 W. 5300 Jacklin Ave., Post Falls, ID 83854-9499 Albany, Oregon 4 replications, 50 plants each = 700 plants Sost Falis, Idano 400 spaced plants Albany, Oregon

VAN J JORA

LEAF BLADE					
* 4	Green Color:	1 = Light green (Mystic)	2 = Medium green (Fy	lking, Bonnieblue)	
		3 = Moderately dk. green (Merion, Adelphi) 4 =	Very dk. green (Nugget, Glade	e, Enmundi)
* 4	Bluegreen color:	1 = Not bluegreen (Mystic,	Touchdown, Parade) 2 =	Moderately bluegreen (Merion	, A-34)
4.640		3 = Bluegreen (Nugget, En	mundi, Adelphi) 4 =	Strongly bluegreen (Majestic)	
2	Winter color:	1 = Light green	2 = Dark green	3 = Light purple	
		4 = Dark purple	5 = Not purple	6 = Not green or purple	
* 1	Hairs upper side:	1 = Absent (Nugget)	2 = Sparse (Merion)	3 = Dense (Park)	
.2	Hairs lower side:	1 = Absent (Fylking, Merio	n) 2 = Sparse	3 = Dense (Nugget)	
2	Luster upper side:	1 = Shiny (Eclipse, Enmun	di) 2 = Dull (Aquila, Parad	de)	
I	Luster lower side:	1 = Shiny (Mystic, Enmun	di) 2 = Dull (Barbie, Eclip	se)	
* 2	Margin hairs (Fring	ge on Margin or Base):	1 = Absent (Delta)	2 = Present (Fylking, Meric	on)
* 5	Width:	1 = Very fine (Mystic)	2 = Fine (Nugget)	3 = Medium (Merion, Fylk	ing)
		4 = Broad (Adelphi, Baron) 5 = Very broad (Mono	poly)	
	mm Width (flag le				
	mm Narrower than	* -	1 = Nugget	2 = Fylking	3 = Delta
	Width same as	* (4 = Merion	5 = Newport	6 = Baron
	mm Wider than	*	7 = Mystic	8 = Sabre	9 = Reubens
49		, , , , , , , , , , , , , , , , , , ,	7 - Wystic	6 - Sabie	9 - Neubelis
217	mm Length (flag le	* -			
	mm Shorter than	* 3	1 = Nugget	2 = Fylking	3 = Delta
	Length same as	*	4 = Merion	5 = Newport	6 = Baron
3 5	mm Longer than	<u> </u>	7 = Mystic	8 = Sabre	9 = Reubens
		f (angle to stem):	1 = Appressed	2 = Open angle, yet stiff	3 = Nodding
LEAF SHEAT	Ή:				
Щ	mm sheath length				
*	Seedling Color (ba	se of sheath): 1 = Green (N	ugget, Merion) 2 = R	ed (Delta)	
* 2	Hairs on Margin:	1 = Absent (Fylking)	2 = Present (Nugget)		
* 1	Margin Roughness	(to touch): 1 = Smoo	th (Delta) 2 = Roug	h (Sabre)	
	Hairs on Surface:	1 = Absent () 2 = P	resent (Nugget)	
1	Surface Roughness	(to touch): 1 = Smoo	th (Fylking) 2 - Rough	(Ram I)	
2	Hairs on both side	s just beneath leaf blade (un	der collar): 1 = Absent (Merion) 2 = Present (Nug	get)
* 2	Hairs on Ligule:	1 = Absent (Fylking)	2 = Short (Baron) 3 =	Long (Nugget)	
		= Absent (Mystic, Enmundi)			
		,, e, Eaidi)			

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PANICLI	(Ma	rure Plant):
0 9	7	mm Length (Lowest branch whorl to top, for 10 plants) Test area: Albany, Oregon
5	0	mm Shorter than 3 1 = Nugget 2 = Fylking 3 = Delta
		Panicle same as 2 4 = Merion 5 = Newport 6 = Baron
0 5	2	mm Longer than 7 = Mystic 8 = Sabre 9 = Reubens
*	1	Color (at 50% flowering): 1 = Not red (Fylking) 2 = Red (Nugget)
	- 10	Shape of Rachis (opposite lower side branches): 1 = No bend (Nugget 2 = Bend (Merion)
*	-	Collar: 1 = Opened (Nugget) 2 = Closed (Merion)
*	1	
		Branches Attitude (Lowest whorl): 1 = Drooping (America, Prato) 2 = Horizontal (Merion)
3	.9	3 = Ascending (Tundra) Number of main branches in lowest whorl
*	2	
*	1	Panicle Habit: 1 = Nodding (Newport) 2 = Upright (Nugget) Panicle Type: 1 = Open 2 = Intermediate 3 = Compact
	-	The same of the sa
		Anther color (anthesis): 1 = Purple 2 = Yellow 3 = Brown
LEMMA	3	Kool 1 - Claharan 2 - Silvini
*	3	Keel 1 = Glabrous 2 = Slightly pubescent 3 = Pubescent
	-	Marginal Nerves
7	7	Intermediate Nerves: 1 = Distinct 2 = Obscure
	Ľ	Basal Webbing: 1 = Absent 2 = Scant (Baron) 3 = Copious (Merion)
0 .8	6 5	mm. Width (average of 10) Milligrams per 10,000 seed Milligrams less than Weight same as Milligrams more than Weight Class (g per 10,000 seed): The Nugget 2 = Fylking 3 = Delta 4 = Merion 5 = Newport 6 = Baron 7 = Reubens 8 = Sabre 1 = Light (< 3g Sydsport, Merion) 2 = Medium (3g - 4g Adelphi, Parade)
Tracket.		3 = Heavy (> 4g Fylking, Nugget)
ENVIRO Highly	NME	NTAL RESISTANCE: (0 = Not tested; 1 = Very susceptible; 2 = Moderately susceptible; 3 = Moderately resistant; 4 =
i iigiili		
	3	Cool Temperature (Winter color) 4 Cold (injury) 3 Heat 3 Drought
	2	Shade 3 Low Fertility 0 Acid Soil 0 Alkalinity
	0	(<ph (ph="" 5.5)=""> 7.5)</ph>
		Sailnity Soil Compaction Poor Drainage Air Pollution
4.0		Other (Specify)
DISEASI	RES	ISTANCE: (0 = Not tested, 1 = Very susceptible, 2 = Moderately susceptible, 3 = Moderately resistant, 4 = Highly Resistant
*	3	Melting-Out Drechslera poae (Helminthosporium vagans) Sclerotina Patch S. borealis
*	3	Helminthosporium Leaf Spot Bipolaris sorokiniana 3 Stem Rust Puccinia graminis
	0	Brown Patch Rhizoctonia solani Stripe Rust P. striiformis
	1	Powdery Mildew Erysiphe graminis Leaf Rust P. poae-nemoralis
*	0	O O
		Stripe Smut Ustilago striiformis Orange Stripe Rust P. poarum

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12. DISEASE F	RESISTANCE	(Continued)				8400005
. 0	Flag Smu	ut Urocystis agropyri		Pythium Blight P	ythium spp.	
3	Pink Sno	w Mold <u>Fusarium</u> nivale		Red Thread Cort	icium fuciforme	
3	Ergot Cl	aviceps purpurea		3 Other Puccin	ia coronata	
* 3	Fusarium	Blight Fusarium roseur	n, F. tricinctum	3 Other Cortic	ium fusiforme	
0	Typhula	Blight Typhula spp.				
3	Dollar Si	pot Sclerotinia homoeoc	arpa			
Resemblan	Sod Web Bluegrass White G Greenbu Other Other y or varieties ce by placing	s Billbug Sphenophorus rub (Japanese Beetle, Ch g Aphid Schizaphis gram	parvulus parvulus pafers. (give species	n variety. For the following of the following numbers: 1 = Applied to the disease resistant, etc.	characteristics indicate De	egree of
	T					
CHARAC	TER	VARIETY	D.R.	CHARACTER	VARIETY	D.R.
Maturity-headin	g	Delta	2	Leaf width	Baron	3
Height	-	Newport	2	Leaf color spring	Adelphi	3
Seed size		Baron	3	Leaf color summer	Eclipse	
Seed weight		Nugget	3	Leaf color winter	Ram I	3
Cold injury		Baron	2	Drought	Baron	3
Heat	of the same of the	Baron	3	Disease ★ ★		

** Specify each disease evaluated,

Heat Shade

15. ADDITIONAL DESCRIPTION:

Describe all characteristics and conditions that cannot be adequately described in this form in Exhibit D.

inia coronata	3 Pucei			
icium fueiforms	ול ביינו			
Baron Adelphi		3 2 2		
Foliose			Newport Baron	
			Mugget	
and and are find				

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ADDITIONAL DESCRIPTION OF THE VARIETY

Nassau is a turf-type Kentucky bluegrass cultivar of early maturity. It is capable of producing a persistent, drought tolerant, moderately dense, dark blue-green turf with relatively wide leaf blades. It has shown good resistance to dollar spot incited by Sclerotinia homoeocarpa F.T. Benett, leaf spot caused by Drechslera poae (Baudys) Shoem, red thread, incited by Corticium fusiforme (Berk.) Wakef., and stripe rust caused by Puccinia striiformis West. Nassau has shown good winter hardiness, excellent winter color retention and early spring green-up. Nassau is adapted to a wide range of soil types, is not overly aggressive in turf and is recommended for use in blends with other bluegrass cultivars and in mixtures with turf-type tall fescues, or fine leafed fescues and perennial ryegrasses.

Seed of Nassau can be distinguished from Baron and all other Kentucky bluegrass varieties by isoenzyme marking (see following abstract)

Isoenzyme markers for Kentucky bluegrass cultivar identification. L.Wu, J.A. Harding, A.H. Harivandi and W.B. Davis, Univ. of California, Davis. (American Society of Agrnomy Annual Meeting, Washington, D.C., August 14-19, 1983)

Twenty five Kentucky bluegrass cultivars were examined for isoenzyme varation in esterase, perioxidase, phosphoglucomutase, phosphoglucoisomerase and glutamate—oxaloacetate transaminase using starch-gel-electrophoresis. The five enzyme systems were found to be vary in their isoenzymes among the 25 cultivars. Baron, Fylking, Merion and Newport cultivars were examined for isoenzyme pattern differences between seed and seedling materials, and distinct differences were found between the two kinds of tissues. Seed of Adalphi and Glade harvested from different fields in Washington and Idaho, and in different years 1976, 1981 and 1982 were examined for isoenzyme consistency. The proportion of apomictic seed in each cultivar and seed collection was estimated by the degree of zymogram identity among theplants established from seed, and was found to be vary from 70% to > 90%. However, a mixed seed or seedling sample of each collection showed identical zymograms between the collections of different fields and years. These results demonstrate that isoenzyme markers can be used for the identification of Kentucky bluegeass cultivars.

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MATERIALS & METHODS

A horizontal starch gel electrophoresis (modified from Shaw and Prasad 1970) was employed to separate the electrophoratic variants of the esterase (EST), phospnoglucomutase (PGM), phosphoglucoisomerase (PGI) and glutamateoxaloacetate transaminase (GOT) enzyme systems. Tris-citric buffer (0.0152M) was used for gel preparation. Gel buffer (375 ml) was boiled and rapidly mixed with starch (Sigma starch Hydrolyzed), 60gm., previously suspended in 125 ml gel buffer. The hot, viscous starch suspension was evacuated and poured into a 18 x 17 x 1cm plexiglass gel form and covered with a glass plate, and allowed to cool to about 20C. The paper wicks, saturated with enzyme extracts, were inserted into a vertical cut in the gel 5 cm from the cathodal end, across the 17 cm width. The electrode reservoirs were filled with 150 ml 0.3 M Na-boric pH 8.6 tray buffer and used as bridges to the gel. The gel was covered with plastic wrap and a glass plate and placed in an 5 C incubator. After 10 min equilibration at 300 volts (at 50 A) the wicks were removed and the electrophoresis continued at 300 volts until the front (indicated with bromophenoblue) had moved 8 cm from the origin. The gel was horizontally sliced with a steel wire into 5 slices. The top slice was discard. Each of the remaining four slices was stained for a separate enzyme.

Esterase (EST): 100 mg of fast blue RR salt was dissolved with 100 ml of 0.05 M phosphate buffer, pH 6.0. 1.5 ml 1% a-naphthyl acetate (dissolved in acetone) was added to the buffer and fast blue RR salt solution and mixed well just prior to use. The gel was incubated in the substrate buffer solution for 2 hrs in the dark at 36C.

Glutamate-oxaloacetate (GOT): 150 mg of aspartic acid and 100 mg of a-Ketoglutaric acid were dissolved in 95 ml 0.05 M tris-HC buffer, pH8. The pH was than adjusted with 0.1 M KOH back to pH8.0. Immediately before staining 5 mg pyriodoxal 5 phosphate and 150 mg fast blue BB salt were added into the substrate buffer solution. The gel was incubated at 36 C in the dark for 2 hr.

Phosphoglucoisomerase (PGI): Five ml 10% MgCl₂ 0.018 M fructose-6-phosphate and 4 ml glucose-6-phosphate dehyorogenase (1000 u/100 ml H₂0) were added to 90 ml 0.05 M Tris-HO buffer pH 8.0. Five mg NBI (Nitroblue tetrazolium), 20 mg MTT (3-4,5 - Dimethyl Thiazoly 1-2) -2, 5-diphenyl Tetrazolium Bromide) and 5 mg PMS (Phenazine Methosulfate) were mixed into the buffer substrate solution and immediately poured on the gels for staining. The gels were kept at 36 C for 2 hr.

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Phosphoglucomutase (PGM): Five ml 1% 2-D-glucose-1-phosphate disodium salt, 1 ml 0.05% a-D-glucose-1, 6-Diphosphate, 2 ml 10% mgCl₂ and 4 ml glucose-6-phosphate dehydrogenase (1000 u/100 ml) were added to 95 ml 0.05 M Tris-Hol buffer pH 8.0. Five mg NBT, 2 mg PMS and 10 mg MTT were mixed with buffer just prior to staining. Gels were incubated at 36C in the dark for 2 hours.

After the enzyme staining was completed the gels were rinsed and fixed in 50% glycerin.

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JAN 1 4 1998

LONNA R. HOOKS SECRETARY OF STATE

CERTIFICATE OF MERGER OF LOFTS SEED, INC. INTO LOFTS MERGERCO, INC.

To: The Secretary of State
State of New Jersey

Pursuant to the provisions of Section 14A:10-7 Corporations, General, of the New Jersey Statutes, the undersigned corporations hereby execute the following Certificate of Merger.

ARTICLE ONE

The names of the corporations proposing to merge and the states under the laws of which such corporations are organized, are as follows:

Name of Corporation

State of Incorporation

Lofts Seed, Inc. Lofts Mergerco, Inc.

New Jersey Nevada

ARTICLE TWO

The laws of the State of Nevada, the state under which such foreign corporation is organized, permit such merger and the applicable provisions of the laws of said jurisdiction have been, or upon compliance with filing and recording requirements will have been, complied with.

ARTICLE THREE

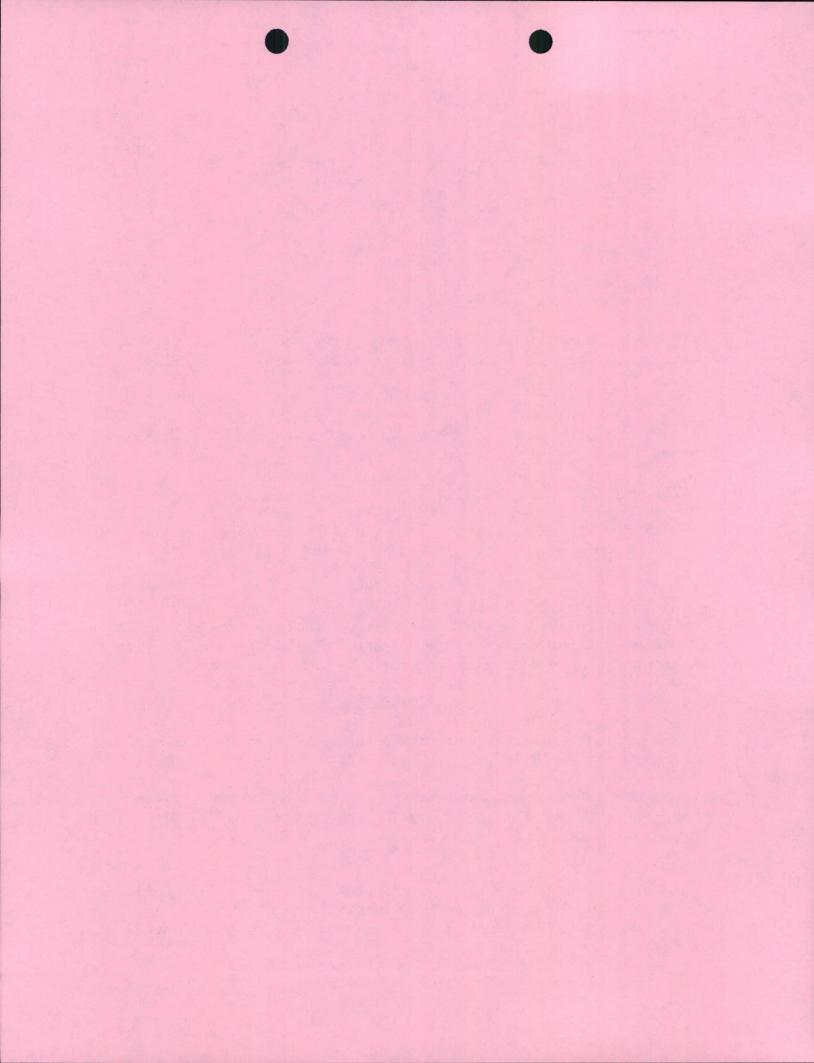
The name of the surviving corporation shall be Losts Mergerco, Inc. and it shall be governed by the laws of the State of Nevada.

The address of the surviving corporation's registered office is 2700 Sunset Rd., Las Vegas, Nevada 89120 and the name of the registered agent at such address is Johnny Thomas.

ARTICLE FOUR

The following plan of Merger was approved by the shareholders of the undersigned domestic corporation in the manner prescribed by the New Jersey Business Corporation Act, and was approved by the undersigned foreign corporation in the manner prescribed by the laws of the State under which it is organized:

0100731429



GECRETARY OF STATE OF THE STATE OF ALEVADA

CERTIFICATE OF AMENDMENT OF

ARTICLES OF INCORPORATION OF

LUITS MERGERCO, INC.

JAN 2 6 1998 C-2/- 3/2// (12)

THE HELLED SECRETION OF THE

Pursuum to the provisions of Nevada Revised Statutes, Title 7, Chapter 78, the undersigned officers do hereby certify:

FIRST: The name of the Corporation is Lofts Mergerco, Inc.

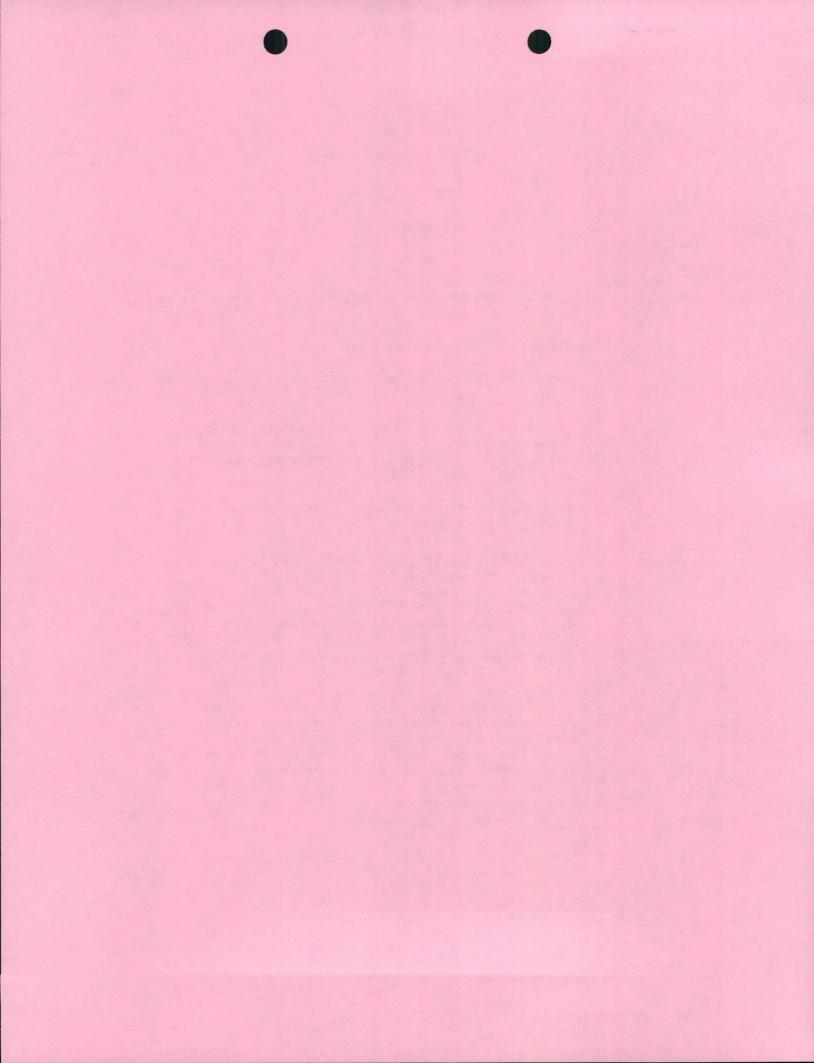
SECOND: The Board of Directors of the Corporation duly adopted the following resolutions on January 10, 1998:

RESOLVED, that it is advisable in the judgment of the Board of Directors of the Corporation that the name of the Corporation be changed, and that, in order to accomplish the same, Article FIRST of the Articles of Incorporation be amended to read as follows:

"FIRST: The name of the corporation (hereitafter called the Corporation) is Lofts Seed Company, Inc."

FURTHER RESOLVED, that a special meeting of the sole stockholder having voting power be and it is hereby called and that notice be given in the manner prescribed by the By-laws of the Corporation and by Nevada Revised Statutes, Title 7, Chapter 78, unless the said stockholder shall waive the notice of meeting in writing or unless the said stockholder shall dispense with the holding of a meeting and shall take action upon the proposed amendment by a consent in writing signed by the sole stockholder; and

FURTHER RESOLVED, that in the event that the said stockholder shall adopt the aforesaid proposed amendment by a vote in favor thereof by at least a majority of the voting power or by a written consent in favor thereof signed by the sole stockholder without a meeting, the Corporation is heroby authorized to make by the hands of its President or a Vice President and by its Secretary or an Assistant Secretary a certificate setting forth the said amendment and to cause the same to be filed pursuant to the provisions of Nevada Revised Statutes, Title 7, Chapter 78.



THIRD: The total number of outstanding shares having voting power of the Corporation is 200, and the total number of votes entitled to be cast by the holder of all of said outstanding shares is 200.

FOURTII: The holder of all of the aforesaid total number of outstanding shares having voting power dispensed with the holding of a meeting of the sole stockholder and adopted the amendment herein certified by a consent in writing signed by the sole stockholder in accordance with the provisions of Nevada Revised Statutes, Title 7, Section 78.320.

January 22 1998

LOFTS MERGERCO, INC.

Johney R. Thomas

President

Kathleen L. Gillespi Assistant Secretary

State of Nevada)

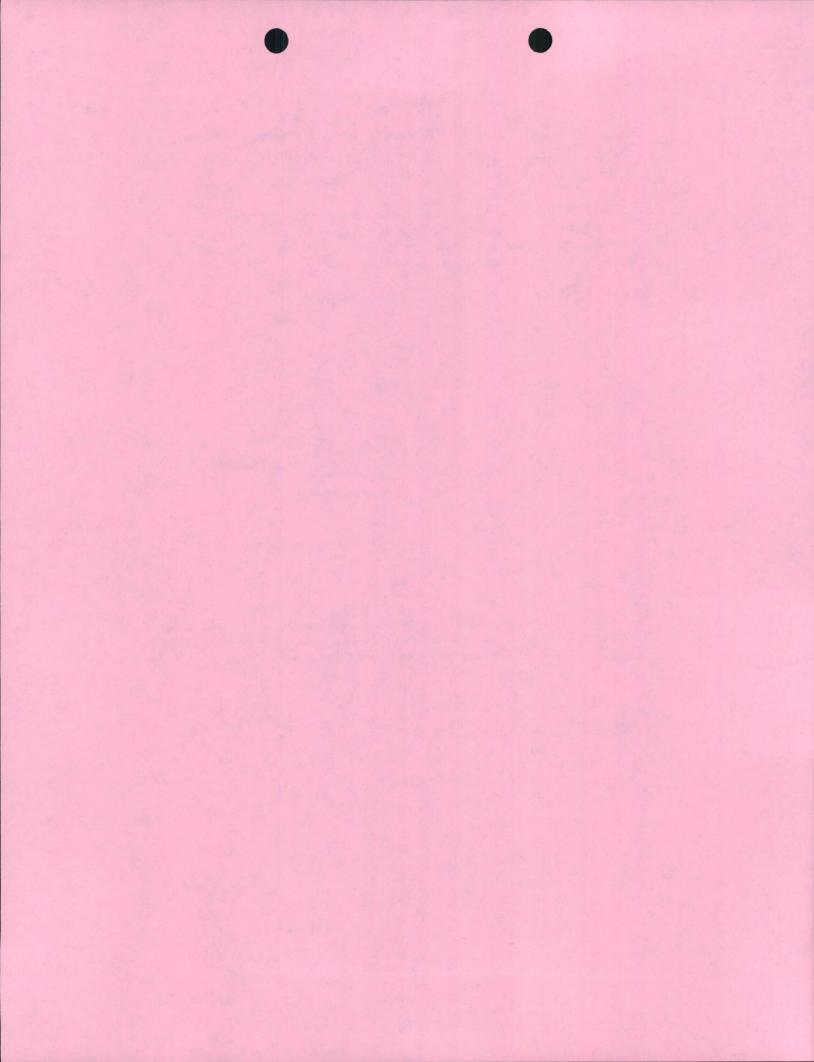
) SS .:

County of Clark)

On January 22, 1998, personally appeared before me, a Notary Public, for the State and County aforesaid, Johnny R. Thomas, as President and Kathleen L. Gillespie, as Assistant Secretary of Lofts Mergerco, Inc., who acknowledged that they executed the above instrument.

NOTARY PUBLIC
STATE OF NEVADA
County of Clark
C.J. WORTH
My Systematic Systematic Light

Notary Public



STATE OF NEVADA

NOV 2 9 1999

ARTICLES OF MERGER LOFTS SEED COMPANY, INC. INTO AGRIBIOTECH, INC.

Pursuant to the provisions of N.S.R. § 92A.180 and N.R.S. § 92A.200, AgriBioTech, Inc., DEAN HELLER, SECRETARY OF STATE a Nevada corporation, hereby submits these Articles of Merger for the purpose of merging Lofts Seed Company, Inc., a Nevada corporation and wholly-owned subsidiary of AgriBioTech, Inc., into AgriBioTech, Inc.

ARTICLE I. Corporations Proposing to Merge and Surviving Corporation

The name of the merging corporation is Lofts Seed Company, Inc., a Nevada corporation (hereinafter called the "Subsidiary Corporation"); and the name of the corporation which shall be the surviving corporation is AgriBioTech, Inc., a Nevada corporation (hereinafter called the "Parent Corporation").

ARTICLE II. Adoption of Plan of Merger

The Plan of Merger set forth in Article IV was duly adopted by the Parent Corporation and the Subsidiary Corporation.

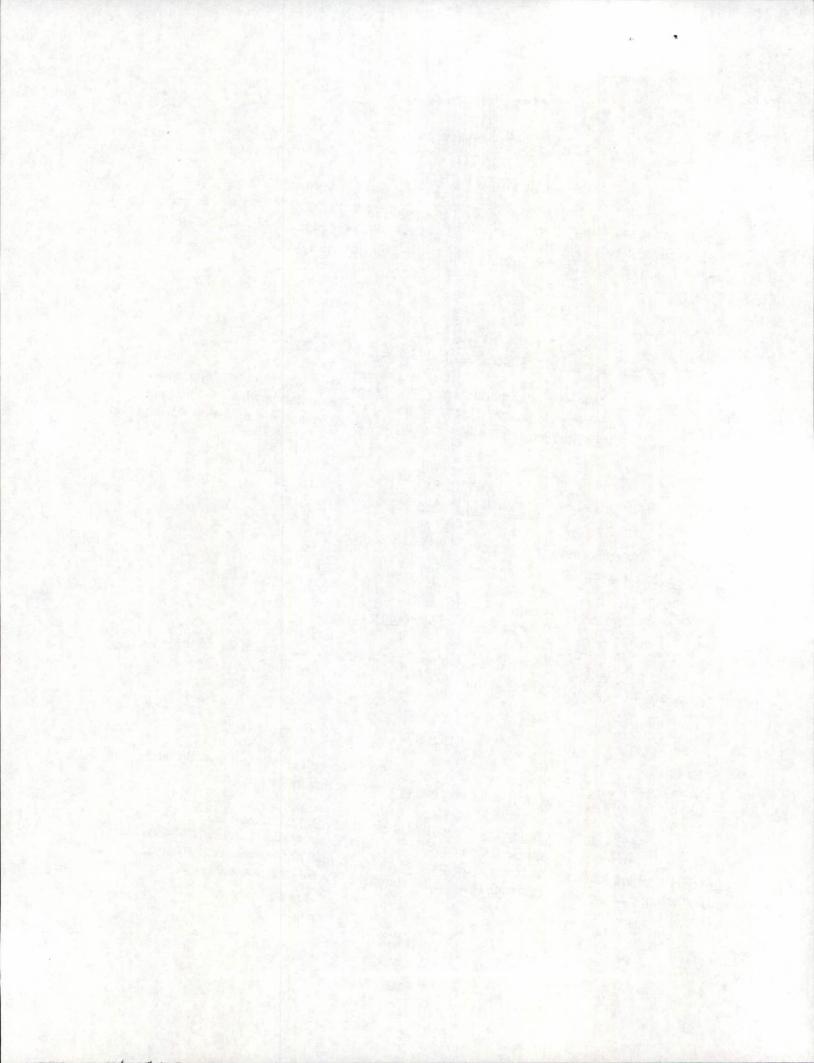
ARTICLE III. Approval by Shareholders

Pursuant to N.R.S. § 92A.180, neither the approval of the Shareholders of the Parent Corporation, nor the approval of the Shareholders of the Subsidiary Corporation was required.

ARTICLE IV. Plan of Merger

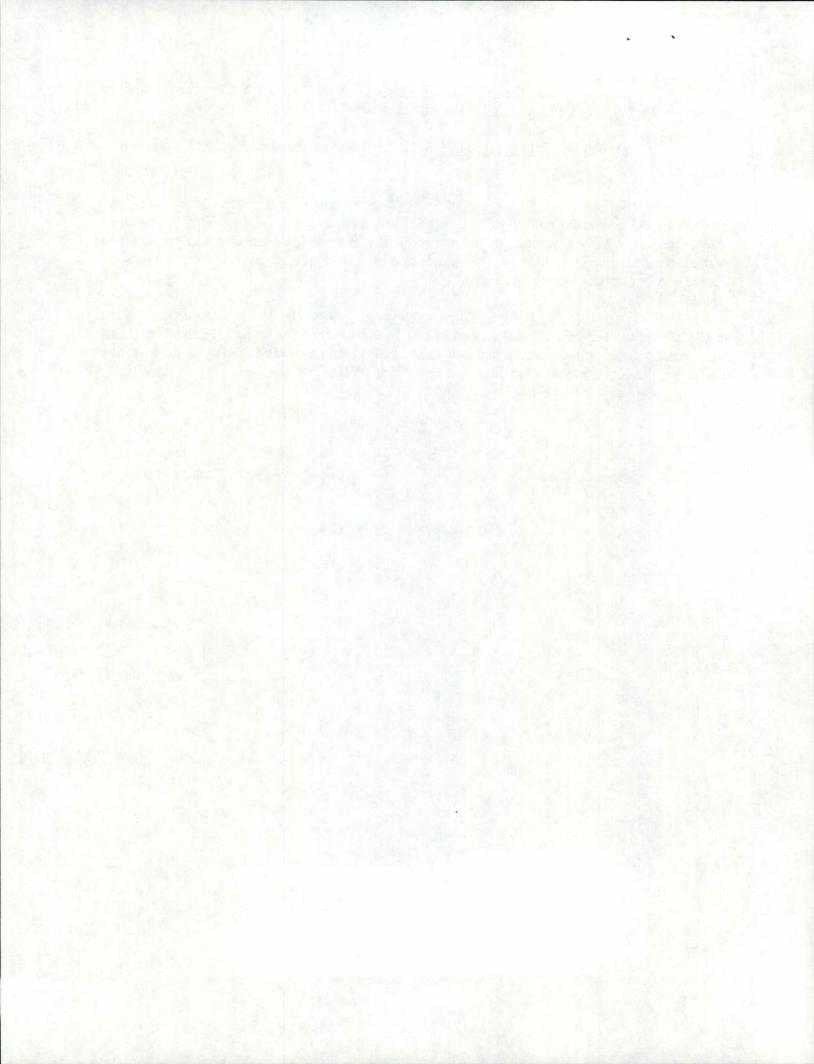
The following Plan of Merger was duly approved on November 15, 1999, in the manner prescribed by law with respect to each of the corporations participating in the Merger:

Corporations Proposing to Merge and Surviving Corporation. The name of the merging corporation is Lofts Seed Company, Inc., a Nevada corporation (hereinafter called the "Subsidiary Corporation"); and the name of the corporation which shall be the surviving corporation is AgriBioTech, Inc., a Nevada corporation (hereinafter called the "Parent Corporation").



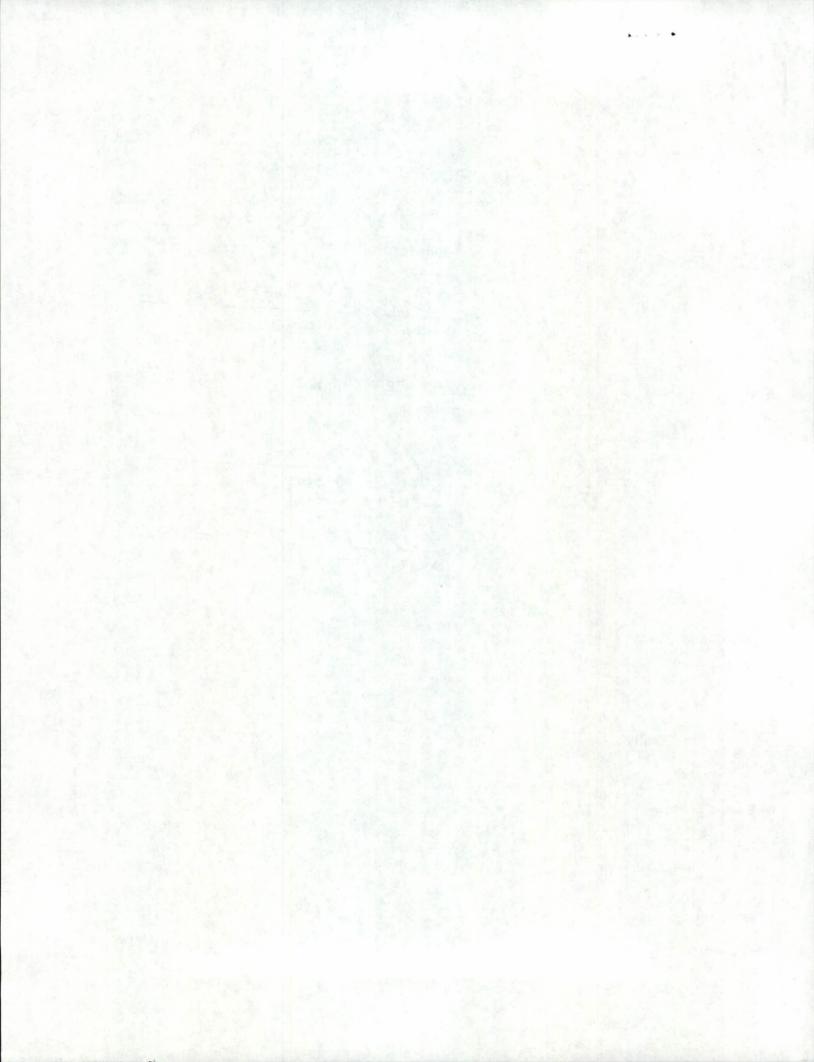
- Section 2. <u>Effective Time of Merger</u>. The effective time of the merger shall be November 29, 1999 at 11:59 p.m. E.S.T. (the "Effective Time").
- Section 3. <u>Effects of Merger</u>. The Merger shall have the effects set forth in N.R.S. § 92A.250.
- Section 4. <u>Conversion of Shares</u>. Each share of capital stock of the Subsidiary Corporation issued and outstanding at the Effective Time shall, as of the Effective Time, by virtue of the Merger and without any action on the part of the holder thereof, be canceled and extinguished without consideration given therefor. The shares of capital stock of the Surviving Corporation shall continue to be outstanding without change.
- Section 5. <u>Articles of Incorporation and Bylaws</u>. The Articles of Incorporation and the Bylaws of the Surviving Corporation as in effect immediately prior to the Effective Time shall become the Articles of Incorporation and Bylaws of the Surviving Corporation following the Effective Time until changed in accordance with their terms and applicable law.

[Signature page to follow]



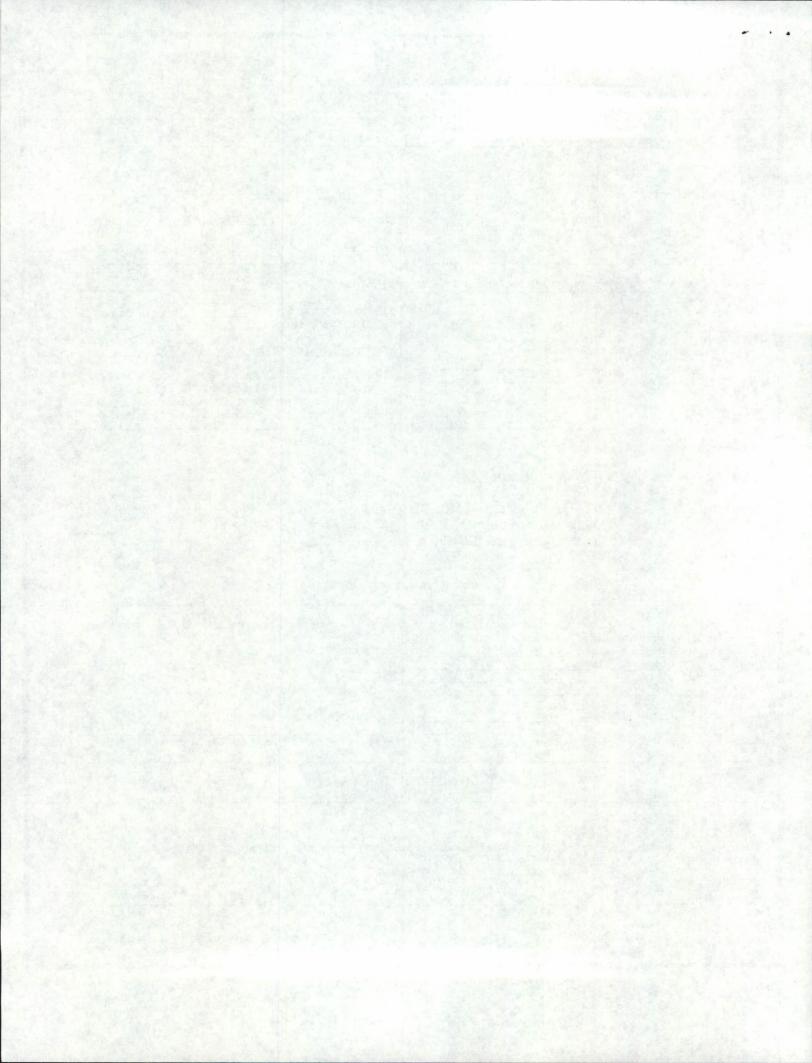
This the 15 day of November, 1999.

AGRIBIOTECH, INC., a Nevada corporation
21/
Y/M/A
By: Randy Ingram, Executive Vice President
Randy Ingram, Executive Vice President
Double A Trol
By: Secretary
Douglas A. Fisher, Secretary
COMPANY, INC., a Nevada
LOFTS SEED COMPANY, INC., a Nevada
LOFTS SEED COMPANY, INC., a Nevada corporation
LOI 15
corporation



RECORDATION FORM COVER SHEET PVP CERTIFICATES ONLY

To the Acting Commissioner of the Plant Variety Protection Office. Plant Variety Protection Office.	ease record the attached original documents or copy thereof.
Name of conveying party(ies):	2. Name and address of receiving party(ies):
AgriBioTech, Inc.	Name: BANK of AMERICA, N.A.,
☐ Individual(s) ☐ Association ☐ Limited Partnership	Street Address: 55 South Lake Avenue, Suite 900
	City: Pasadena State: California ZIP: 91101
Additional name(s) of conveying party(ies) attached? □ Yes ⊠ No	☐ Individual(s) citizenship
3. Nature of conveyance:	☐ General Partnership ☐ Limited Partnership
☐ Assignment ☐ Merger ☑ Security Agreement ☐ Change of Name	☐ Corporation-State ☑ Other National Banking Association
Other Execution Date: June 23, 1998	If assignee is not domiciled in the United States, a domestic
	representative designation is attached: □ Yes □ No (Designation must be a separate document from Assignment) Additional name(s) & address(es) attached? □ Yes ⋈ No
4. PVP certificate identifying information:	
Variety PVP No. Status	
"Rebel Sentry" 9800227 pending, 05/06/98 "Panther" 9800345 pending, 07/21/98 "Nassau" 8400005 Issued, 12/12/84 "Suffolk" 8800072 Issued, 05/31/88	
Additional numb	ers attached? □ Yes ⊠ No
5. Name and address of party to whom correspondence	6. Total number of PVP applications or certificates involved: 4
concerning document should be mailed: Name: Tamsen Valoir Jenkens & Gilchrist	7. Total fee: \$100.00
Internal Address:	⊠ Enclosed
Street Address: 1445 Door Avenue	☐ Authorized to be charged to deposit account.
Street Address: 1445 Ross Avenue, Suite 3200 City: Dallas State: Texas Zip: 75202-2799	Deposit Account number: (Attach duplicate copy of this page if paying by deposit account)
City. Danas State. 1exas Lip. 15202-2199	(A material duplication copy) of this page is paying by deposit account)
DO NOT US	E THIS SPACE
9. Statement and signature.	
To the best of my knowledge and belief, the foregoing information is original document.	thue and correct and any attached copy is a true copy of the
Tamsen Valoir Name of Person Signing Signature Signature	2.9.2(XX) Date
	Total number of pages comprising cover sheet:



PVP CERTIFICATE ASSIGNMENT

WHEREAS, AgriBioTech, Inc., a Nevada Corporation ("Assignor"), having a business address of 120 Corporate Park Drive, Henderson Nevada 89014, (hereinafter referred to as "Debtor"), is the owner of the issued or pending Plant Protection Act (PVP) certificate(s) listed below; and

WHEREAS, Bank of America, N.A., a National Banking Association, having an office at 55 South Lake Avenue, Suite 900, Pasadena, California 91101, as "Agent" for the "lenders" as defined and described in the Loan and Security Agreement dated as of June 23, 1998, and as amended thereafter, collectively known as "Assignee", is desirous of acquiring a SECURITY INTEREST in such PVP certificate(s);

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, said Assignor does hereby sell, assign, transfer and set over unto the said Assignee a SECURITY INTEREST in, to, and under the PVP certificate(s):

Variety	Owner	PVP No.	Status
"Rebel Sentry"	AgriBioTech, Inc.	9800227	Pending since 05/06/98
"Panther"	AgriBioTech, Inc.	9800345	Pending since 07/21/98
"Nassau"	AgriBioTech, Inc.	8400005	Issued on 12/12/84
"Suffolk"	AgriBioTech, Inc.	8800072	Issued on 05/31/88

AgriBioTech, Inc.

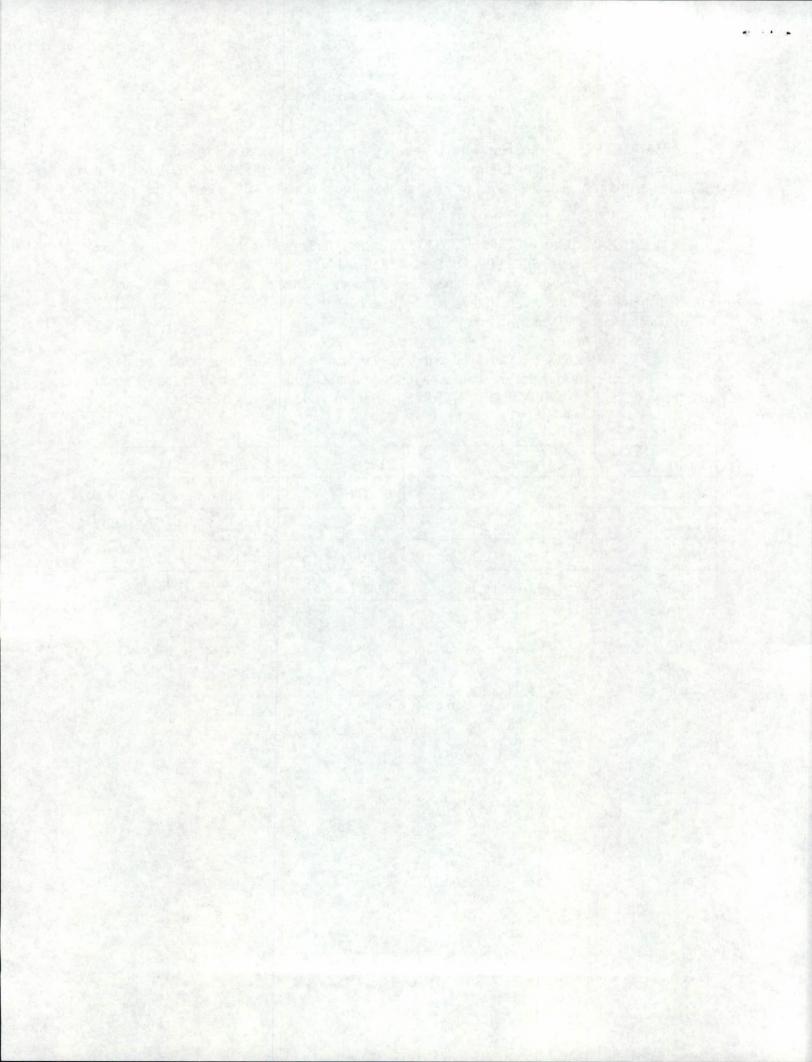
By:

Printed Name:

Title:

Randy Thyram

Title:



STATE OF NEVADA	§	
	§	
COUNTY OF	§	
2	+	of AgrBioTech, Inc., personally clared that s/he signed the assignment in the
Konicy	mgram	of AgrBioTech, Inc., personally
appeared before me, and b	being first duly sworn de	clared that s/he signed the assignment in the
capacity designated, and fu	rther states that s/he has r	ead the above assignment, and the statements

SUBSCRIBED AND SWORN TO before me this 24 day of January, 2000.

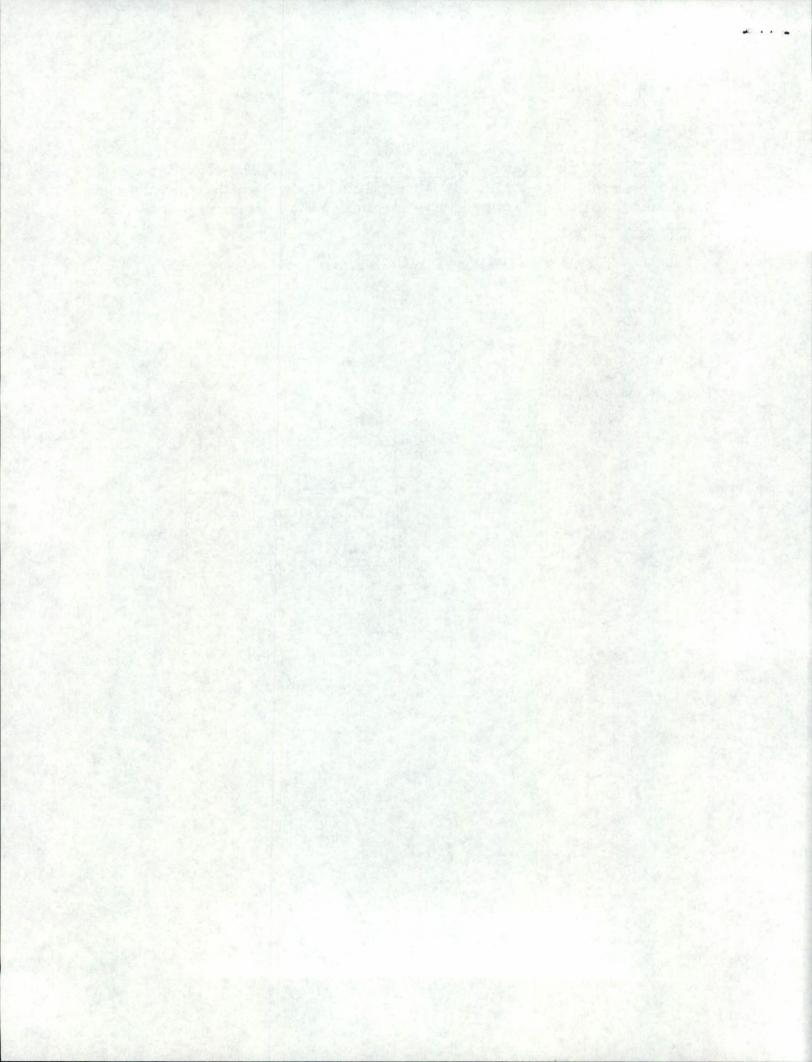
Notary Public in and for the State of Nevada

My Commission Expires: Jan 13, 2002

therein contained are true.

David Pohl Printed Name

> NOTARY PUBLIC STATE OF NEVADA County of Clark DAVID M. POHL Appt. No. 98-0943-1 (Appt. Expires Jan. 13, 2002



8400005

SECURITY AGREEMENT AGRICULTURAL INTELLECTUAL PROPERTY COLLATERAL (Plant Variety Protection Act Certificates)

STATE OF)
) SS.:
COUNTY OF	j j

WHEREAS, LOFTS SEED INC., a New Jersey corporation (the "Company"), is the listed owner of certain plant variety protection applications and certificates issued by the United States Department of Agriculture Plant Variety Protection Office (the "PVPO")all of which are as of this date as set forth on Schedule A (the "PVPs"), and

WHEREAS, the Company is the sole owner of the entire right, title and interest in and to the PVPs except as otherwise indicated in Schedule A and

WHEREAS, the Company has entered into a Loan and Security Agreement, dated on or about the date hereof (the "Loan Agreement"), between the Company as borrower and Branch Banking and Trust Company (the "Lender"), pursuant to which the Lender has, on the date hereof, made certain loans and other financial accommodations to the Company and may, from time to time hereafter, make additional loans to the Company, and

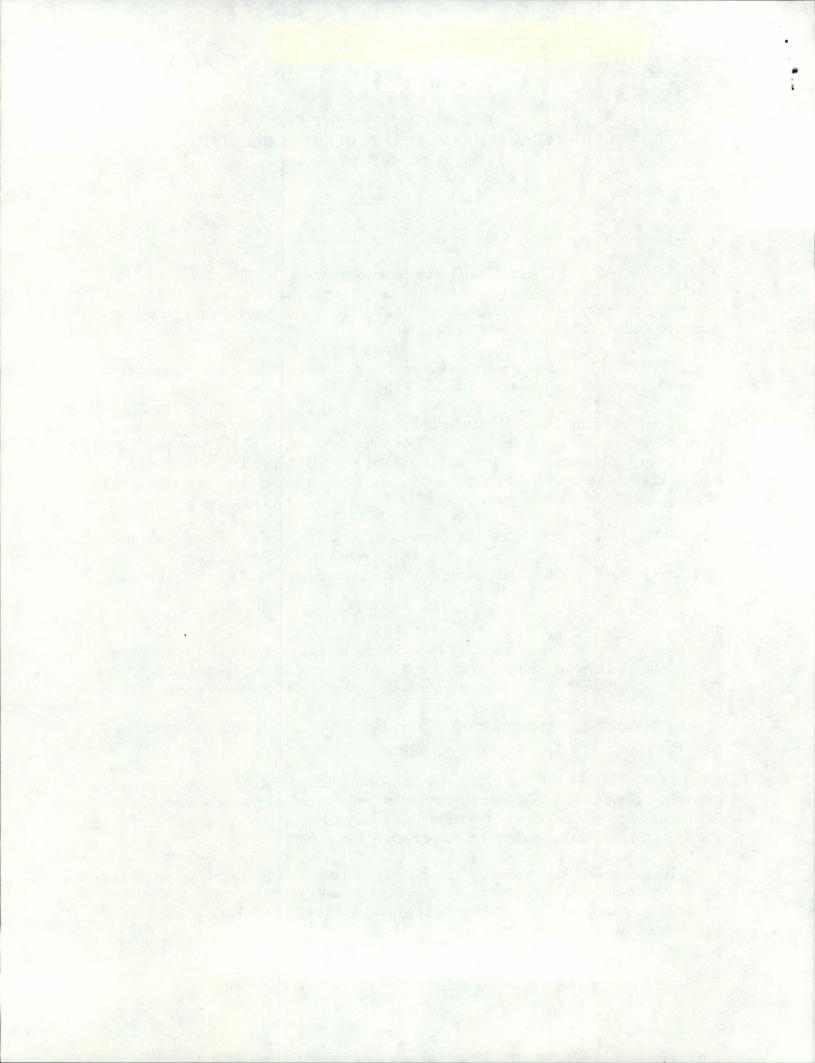
WHEREAS, pursuant to the Loan Agreement, the Company has agreed to grant to the Lender a continuing security interest in, and a continuing lien on, all of the Company's right, title and interest in and to the following (collectively the "Agricultural Intellectual Property Collateral"),

- (a) the PVPs, and
- (b) all proceeds thereof to which the Company is entitled, including, but not limited to, any claims and demands arising out of any infringement of the PVPs, including the right to settle disputes concerning such claims and demands,

to secure the payment and performance of the Obligations and Other Obligations (as defined in the Loan Agreement).

NOW, THEREFORE, for good and valuable consideration, receipt of which is hereby acknowledged, the Company does hereby grant to the Lender a continuing security interest in, and a continuing lien on, the Company's rights in the Agricultural Intellectual Property Collateral as security for the payment and performance of the Secured Obligations.

The Company hereby appoints Lender with full power of substitution, to file and record this Security Agreement in the PVPO, to transact all business in the PVPO, to receive any confirmatory documents relating thereto, and to take any and all action before the PVPO to give effect to this Agreement and to the Loan Agreement referred to herein.



The Company hereby further acknowledges and affirms that the rights and remedies of the Lender with respect to the security interest in and lien upon the Company's rights in the Agricultural Intellectual Property Collateral made and granted hereby are more fully set forth in the Loan Agreement, the terms and provisions of which are hereby incorporated herein by reference as if fully set forth herein.

Further, by this Security Agreement, the Company agrees to assign to Lender, upon the occurrence of an Event of Default by the Company (as defined in the Loan Agreement), all of the Company's rights in and to the Agricultural Intellectual Property Collateral; provided that this assignment is expressly contingent upon the occurrence of an Event of Default.

This Security Agreement will become effective June 28, 1996 at the Effective Time of the Merger of Budd Acquisition, Inc., a New Jersey corporation, with and into Lofts Seed Inc., a New Jersey corporation, as provided in a Certificate of Merger to be filed with the New Jersey Secretary of State's office.

IN WITNESS WHEREOF, the Company has caused this Security Agreement to be duly executed by its authorized officer of agent as of <u>June 28, 1996.</u>

[Corporate Seal]

By: Frehand P. Budd

Name: Title: C E O

LOFTS SEED INC.

On Jone 28, 1996, Richard P.Duld personally came before me, Frances D. Journal Marchard P.Duld personally came before me, Frances D. Journal Marchard P.Duld personally came before me, Frances D. Journal Marchard P.Duld personally came before me, Frances D. Journal Marchard P.Duld personally came before me, Frances D. Journal P.Duld personal P.Duld person

WITNESS my hand and notarial seal.

Notary Public

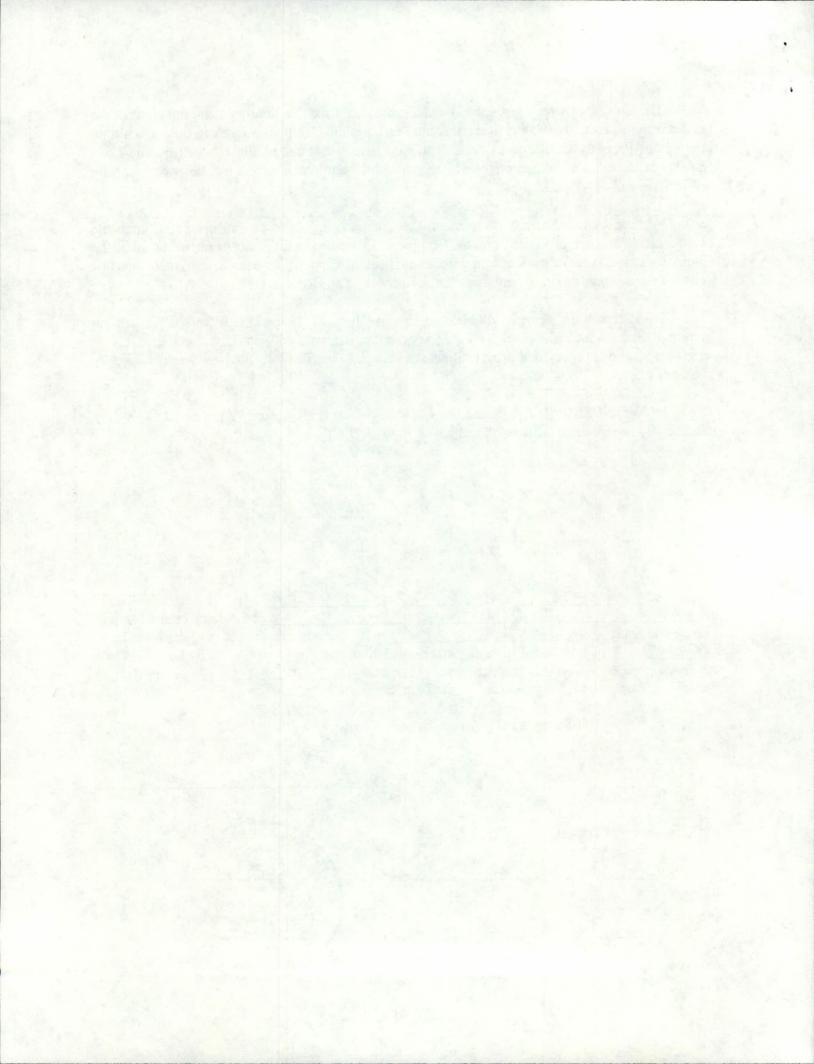
My Commission Expires: 2-9-97

Dated this 28 day of June 1996.

COUNTY OF FORSYTH FRANCES D. SWING

NORTH CAROLINA

R#0185253.01



SCHEDULE A AGRICULTURAL INTELLECTUAL PROPERTY COLLATERAL (CERTIFICATES OF PLANT VARIETY PROTECTION)

A. KENTUCKY BLUEGRASS

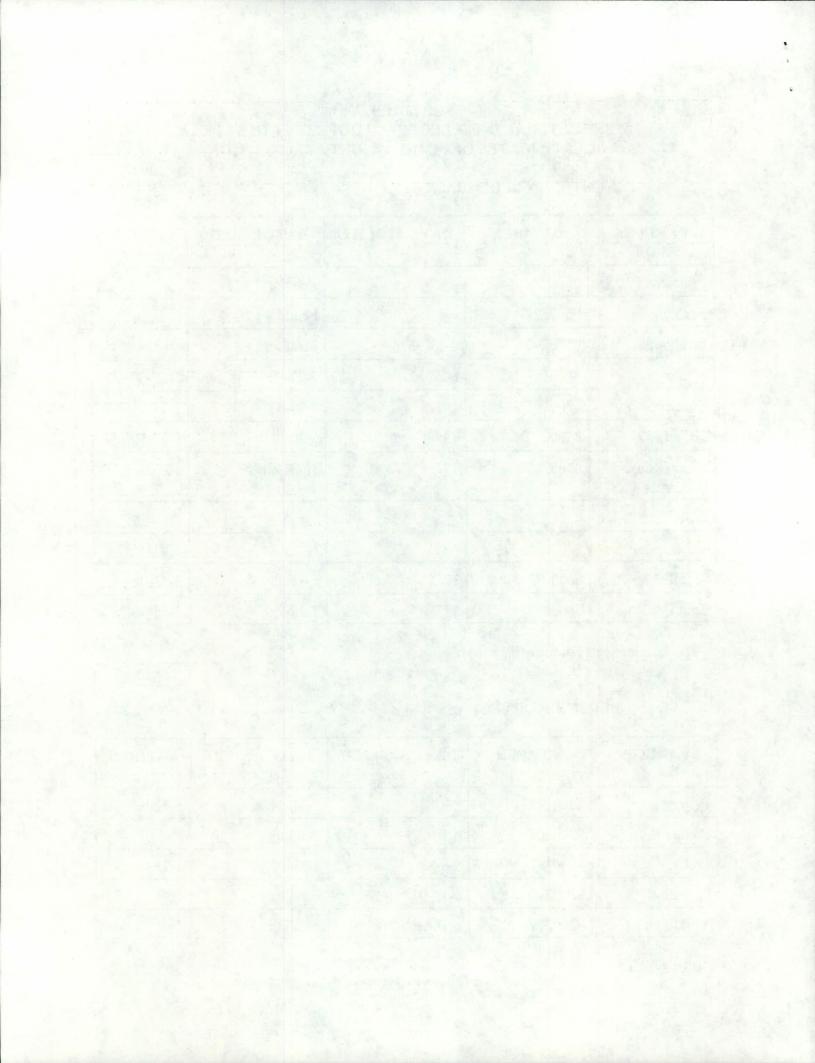
VARIETY NAME	NUMBER	DATE APPLIED	DATE ISSUED	EXPIRES
Princeton P105	9600228	4-22-96	Pending	
Eagleton	9600277	6-11-96	Pending	
Preakness	9500090	2-13-95	Pending	
Mystic	8100157	8-26-81	5-27-82	5-27-00
Georgetown	8200187	1982	7-24-83	7-21-01
Lofts 1757	8800230	1988	9-30-92	9-30-10
Laser (Rough Bluegrass)	8900288	1989	10-31-91	10-31-09
Co-owned PVPs				- A
243 (Nassau)*	8400005	1983	12-21-84	12-21-02
Suffolk*	8800072	1988	5-31-88	5-31-06
Ram I**	7800069	1978	3-15-79	3-15-96

^{*} Jacklin Seed Company listed as co-owner

** Mrs. Barbara B. Curtis listed as co-owner

B. PERENNIAL RYEGRASS

VARIETY NAME	NUMBER	DATE APPLIED	DATE ISSUED	EXPIRES
Palmer	8200178	9-8-82	5-31-84	5-31-02
Palmer II	9200209	6-16-92	Pending	
Prelude	8200177	9-8-82	5-31-84	5-31-02
Prelude II	9200210	6-16-92	Pending	
Yorktown III	9200212	6-16-92	Pending	



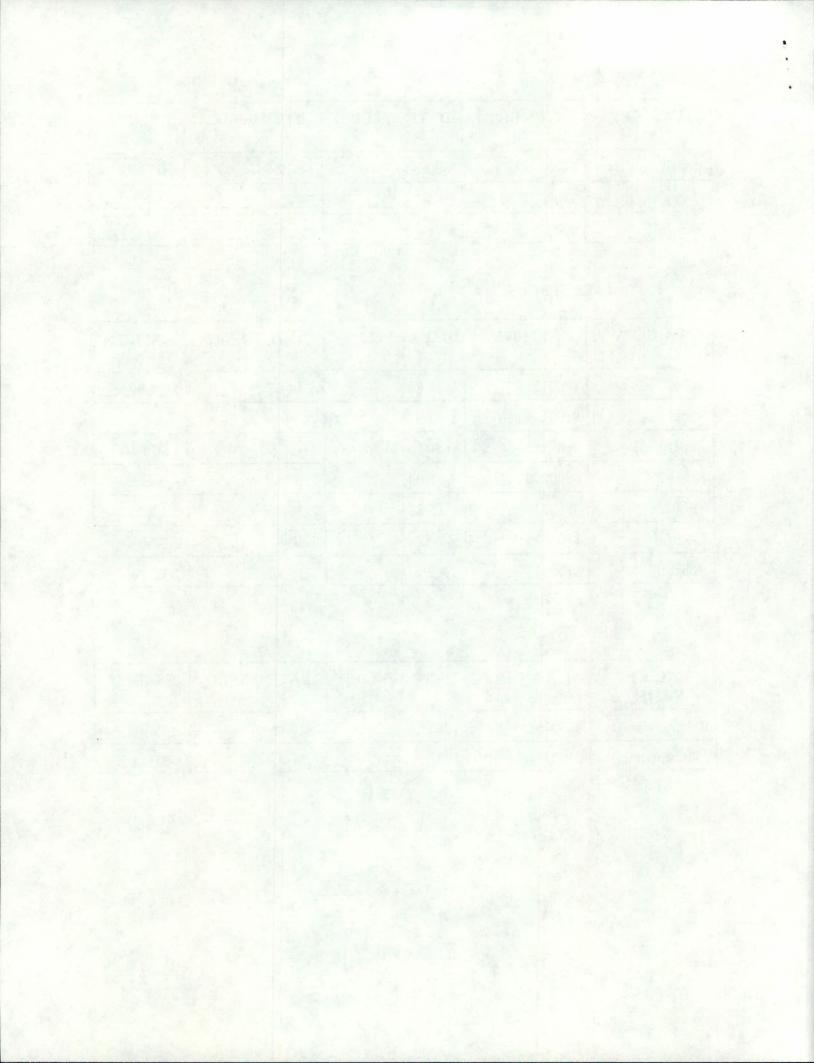
VARIETY NAME	NUMBER	DATE APPLIED	DATE ISSUED	EXPIRES
Repell	8400148	8-30-84	11-29-85	11-29-03
Yorktown II	7800001	10-6-77	5-1-80	5-1-97
Repell II	9200211	6-16-92	Pending	

C. TALL FESCUE

VARIETY NAME	NUMBER	DATE APPLIED	DATE ISSUED	EXPIRES
Rebel	8000153	8-21-80	5-14-81	5-14-99
Rebel III	9500129	4-10-95	Pending	
Rebel Jr.	9000240	1990	11-30-92	11-30-10
Rebel 3D	9300200	4-21-93	Pending	
Tribute	8800235	9-15-88	2-28-90	2-28-08
Clemfine	8200175	9-7-82	2-28-83	2-28-01
Rebel II	8700195	1987	1-15-88	1-15-06

D. FINE FESCUE

VARIETY NAME	NUMBER	DATE APPLIED	DATE ISSUED	EXPIRES
Reliant	8200168	1982	2-28-83	2-28-01
Jamestown II	9100254	1991	8-31-95	8-31-15



E. BENTGRASS

VARIETY NAME	NUMBER	DATE APPLIED	DATE ISSUED	EXPIRES
L93	9600256	5-8-96	Pending	
Southshore	9200256	1992	10-31-94	10-31-12

F. OTHER

VARIETY NAME	NUMBER	DATE APPLIED	DATE ISSUED	EXPIRES
Salty (weeping alkaligrass)	9500128	4-10-95	Pending	
Laser II (rough bluegrass)	9500238	6-15-95	Pending	

